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No. LXXVI.

A Description of the Bones deposited, by the President, in the Museum of the Society, and represented in the annexed plates. By C. WISTAR, M. D. Adjunct Professor of Anatomy, &c. in the University of Pennsylvania.*

THE large bones are the ulna and radius of the left leg. And the plate, No. 1. contains two views of each.

The figure A exhibits the ulna with a view of its surface for articulation with the os humeri (No. 1,) connected with another smooth surface (No. 2) for supporting the upper end of the radius.

The ulna is remarkably thin for so broad a bone, being 2.8 inches in breadth,† and but 1.14 inches thick about the middle.

At the lower end is an oval surface for articulation with the carpus, about 1.8 inches in length, which is not represented in the figure. On the edge next to the radius is a protuberance (A. No. 3.—B. No. 5) which appears calculated to be received into that bone, but its surface, as well as the surface of a corresponding depression of the radius, has been so much abraded that they do not now seem calculated for articulation.)

On the other edge of the bone, at the extremity, is a projection (B. No. 4.) analogous to the styloid process of the human ulna, but not proportionably long, with a smooth surface externally, about eight-tenths of an inch in length, which seems to indicate that one of the carpal bones must have lapped over, or extended beyond it.

The upper end of the radius is nearly oval, it is concave on the top for articulation with a condyle of the os humeri

* See page 246.

† The difference which may be observed between this statement and that of the President is owing to the different methods of measuring—he used a slip of paper whereas the dimensions above were taken with dividers.

meri (C. No. 1.) on one side of it is the smooth surface for articulation with the ulna (C. No. 2.—D. No. 4.) which is so small that it does not appear calculated to admit much rotation, or pronation and supination of the paw; for the oval circumference of the upper end of the bone is 7·6 inches and this surface extends upon it but 1·7 Inches. It is in the same line of direction with the edge of the bone, and not with the flat side of it—When it is applied to the corresponding surface of the ulna the two edges of the bones are opposed, and as there is no rotation of the radius upon the ulna, they must be nearly parallel to each other, without much decussation, making the fore arm immensely broad.

From this arrangement of the bones and their want of rotation and decussation, the palm of the paw would present inwards, and not downwards or backwards, unless the position of the os humeri, or the form of its lower extremity, were particularly calculated to prevent it. At the lower extremity of the radius, on the external surface, (C. No. 3), are several remarkable fossæ or grooves, like those on the human radius, for the tendons of the extensor muscles—The edge of the bone which presents, or is opposed, to the ulna, becomes gradually broader as it extends to the lower extremity (D. No. 5) and there is a depression in it corresponding to the protuberance of the ulna, but the surface is so abraded that no inference can be deduced from it respecting the connection of the bones at this place.

At the lower end of the radius is a deep oblong cavity for receiving the carpal bones, (D. No. 6), its longest diameter is 3·2 inches, its transverse is 2·37 inches, and its depth eight-tenths of an inch. When the ulna is in its natural situation, the cavity for receiving the carpus, formed by both bones taken together, is very near five inches in extent—the carpus was probably equally broad, and the hand or paw much broader. This breadth is not disproportioned to

to that of the fore arm, for when the radius and ulna are placed in their natural position, the breadth of the bones of the fore arm must be six inches, about the middle, and 6 48 inches, at the lower extremity.

The bones represented in plate No. 2, belonged to one of the paws.

The upper row consists of four separate pieces arranged in their natural order, one of which is supposed to belong to the metacarpus, and the other three to a claw or finger.

Under the first bone of the row, is another of the same form, marked also No. 1, the lower bone is much smaller than the uppermost, although they appear to have joined each other in the same paw—At their upper extremities they resemble metacarpal or metatarsal bones, as each of them has an articulating surface for connection with the carpus or tarsus, and another on each side for the other metacarpal bones—they also resemble metacarpal bones, by approaching to the triangular form at this extremity, for the upper surface being broader than the lower, the sides approach nearer below than above, and of course, when they are arranged in contact with each other, they form an arch, corresponding probably with the concavity of the carpus—Their lower extremities, instead of a round head or condyle, have a peculiar form, which the upper end of the smaller figure No. 1 represents imperfectly, for a high ridge of a semicircular form, and a vertical direction when the bone is in its natural position, projects from the articulating surface, and is received into a cavity of the next bone (No. 2. b)—Articulated with this end of the large bone No. 1, is No. 2, which resembles neither the metatarsal bones nor those of the phalanges, and is so short that its length is less than its breadth.

The figures below, marked 2 a, 2 b, exhibit the articulating surfaces of this bone.

The

The surface No. 2. b. corresponds with the lower end of the metacarpal bone, having a deep groove to receive its projecting ridge, and on each side of the groove a smooth surface corresponding to the surfaces on each side of the ridge.

From these surfaces it appears that this bone must have moved considerably on the metacarpal bone, and that its motion was from above downwards in a circular direction.

The other surface of the bone No. 2. a. forms two eminences with a large depression between them, which is well exhibited by the plate, and corresponds with the upper surface of the next bone No. 3.

The form of No. 3 is accurately represented in the plate,—the surface articulated with No. 2 has an eminence in the middle, with a depression on each side of it; corresponding to the eminences and depression of that bone,—the other extremity is flat on the sides, and remarkably round, forming two-thirds of a circle—The articulating circular surface is divided by a very deep groove which is extremely narrow at the bottom to receive a sharp ridge of the next bone.

I believe the position of this bone in the plate is inverted and that the upper side of the figure ought to be down.

The three figures, marked No. 4, will convey an accurate idea of the original state of the bone of the last phalanx, the two largest bones are not entire, the bony case round the root of the unguis, as well as the point, being broken off, in each of them—in the lowermost figure both of these parts are entire, and from this an idea may be formed of the large claw bones before they were mutilated—The surface for articulating with the end of the other phalanx is best represented in the second figure No. 4, the ridge which penetrates into the groove of that bone being very sharp and deep, no motion but that of simple flexion and extension is practicable. The circular form of the surfaces evinces a great

degree of flexion, and the claw could readily move so as to form a right angle with the other phalanx.

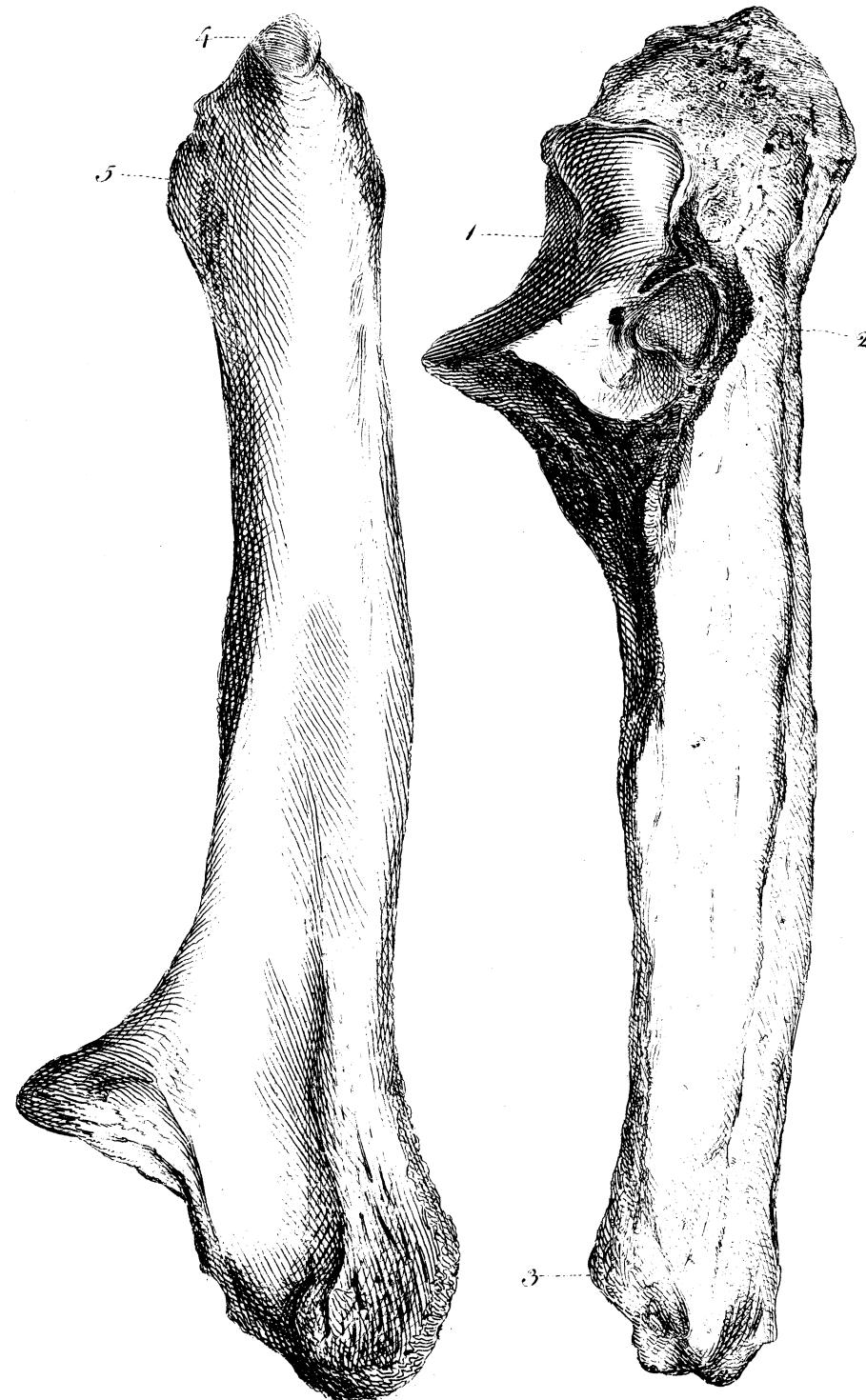
The bone represented by No. 5 has a strong resemblance to the metatarsal bone which supports the little toe, in the human subject—its base has an articulating surface for the tarsus—the internal side is smooth for articulation with the adjoining bone, but externally it projects outwards so as to resemble greatly the bone above mentioned. The extremity connected with the toes has an oblong form, and its greatest length is vertical, so as to be analogous to the ridge on the metacarpal bone No. 1. As this bone is evidently metatarsal, and very different in form and length from the others, I am induced to believe that the others are metacarpal.

From the shortness of the metacarpal bone, and the form and arrangement of the other bones of the paw, and also from the form of the solitary metatarsal bone, it seems probable that the animal did not walk on the toes, *it is also evident that the last phalanx was not retracted*. The particular form of No. 2, and its connection with the metatarsal bone, and with No. 3, must have produced a peculiar species of flexion in the toes, which, combined with the greater flexion of the last phalanx upon the second, must have enabled the animal to turn the claws under the soal of his feet; from this view of the subject there seems to have been some analogy between the foot of this animal and those of the bradypus—having no specimens of that animal I derive this conclusion from the description of its feet given by M. Daubenton.

Notwithstanding a general resemblance, they differ in some important points—In the sloth the figure of the metacarpal bone was such that M. Daubenton could not determine from it, whether the bone belonged to the metacarpus or the phalanges—but there could be no doubt as to these bones, for they are unequivocally metacarpal or metatarsal

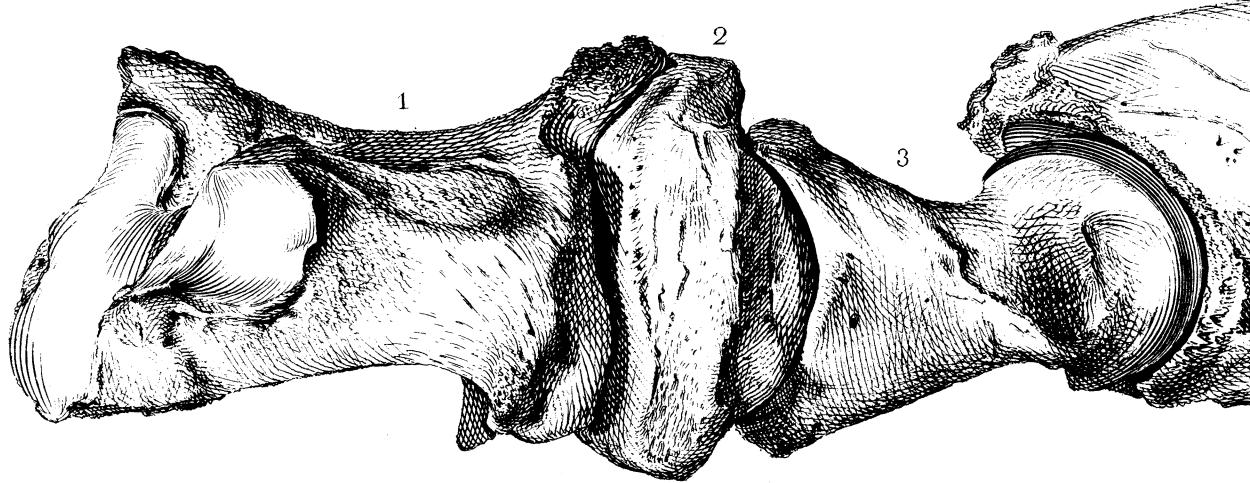
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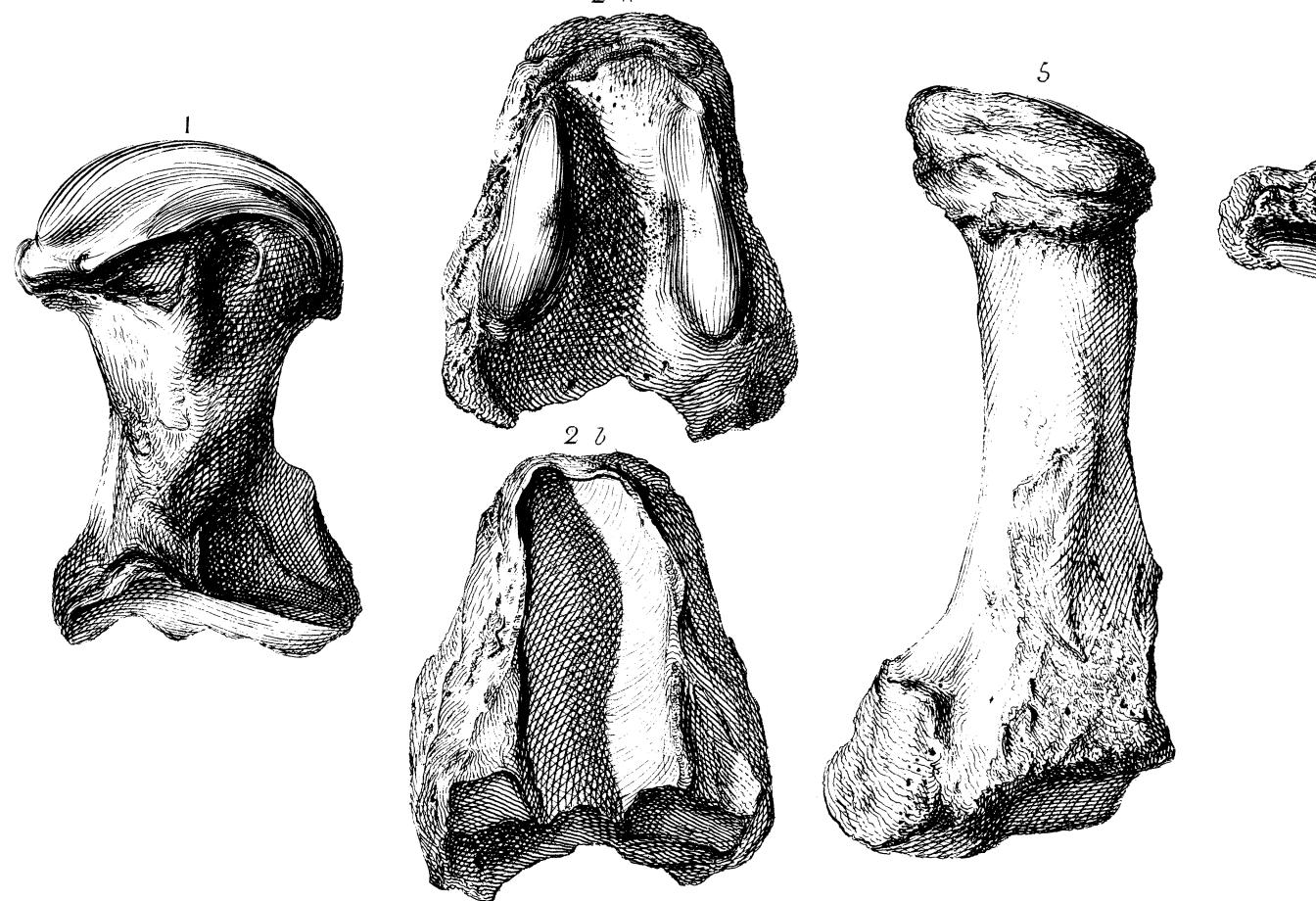


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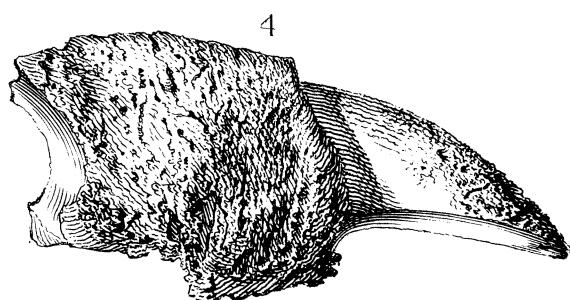
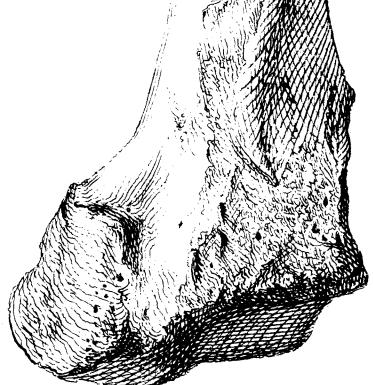
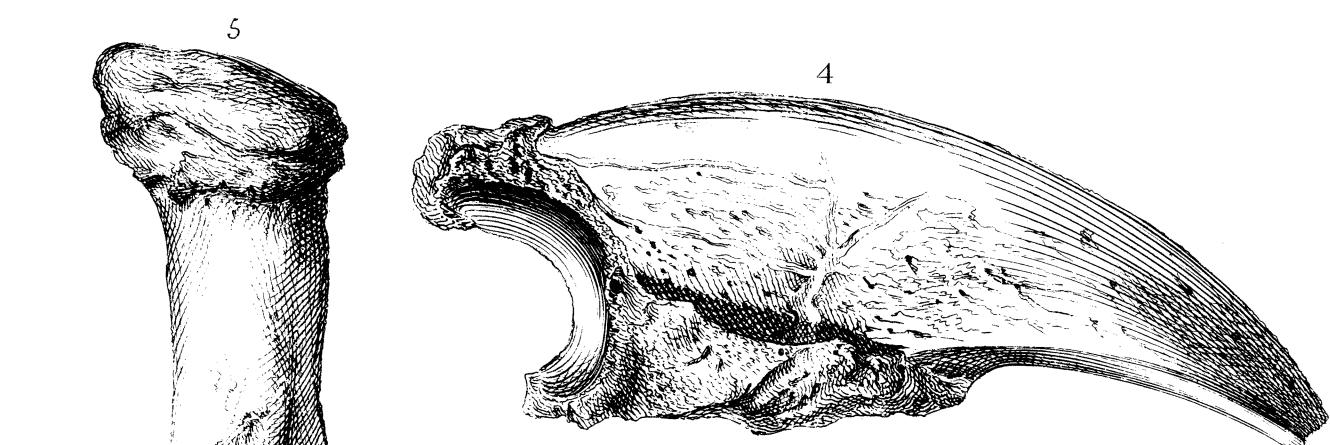
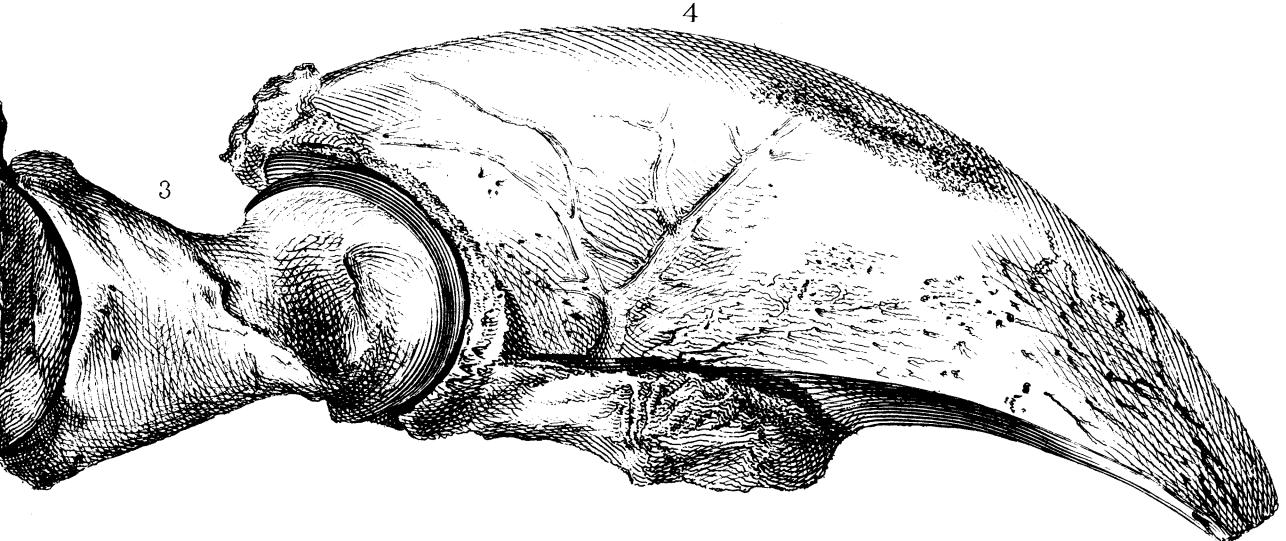




2 *a*



Engraved by James Alain from Chalk Drawings made /the size of the Bones/



In Chalk Drawings made (the size of the Bones) by Doct. W. S. Jacobs:-

metatarsal—The sloth has but two phalanges in addition to the supposed metacarpal bone, whereas the animal in question had bone No. 2 and two phalanges besides. The relative size or proportions of the phalanges, must have differed greatly in the two animals, M. Daubenton describes the first phalanx as very long, and the last, or claw bone, as very short, in the sloth, but the reverse is the case with these bones—There is however an unguis described by M. Daubenton which is particularly interesting, it was presented by M. De la Condamine as belonging to a large species of sloth, and although not entire, its length measured round the convexity, was half a foot, and its breadth, at the base, an inch and a half.

We are naturally led to inquire whether these bones are similar to those of the great skeleton found lately at Paraguay, but for want of a good plate, or a full description we are unable at present to decide upon that subject—if however any credit be due to the representation given in the Monthly Magazine for Sept. 1796 published in London, (the only plate I have seen) these bones could not have belonged to a skeleton of that animal—for according to that representation, the lower end of the ulna is much larger, and articulated with a larger portion of the foot, in the megatherium than in the megalonix—The upper end of the radius also is much larger than the lower in that figure, whereas the reverse is the case with the megalonix, and the difference in the claw bones is still greater, as will appear to every one who compares the two.